

SEQUENCE LISTING

<110> Memorial Sloan-Kettering Cancer Center
Kolesnick, Richard N.
Xing, Hong-Mei R.

<120> KINASE SUPPRESSOR OF RAS INACTIVATION FOR THERAPY OF RAS MEDIATED
TUMORIGENESIS

<130> 1216-1-006PCTUS

<140> 10/516,342

<141> 2004-11-30

<150> PCT/US03/16961

<151> 2003-05-29

<150> 60/384,228

<151> 2002-05-30

<150> 60/460,023

<151> 2003-04-03

<160> 23

<170> PatentIn version 3.1

<210> 1

<211> 120

<212> DNA

<213> Homo sapiens

<400> 1

ctgcagaagc tcatcgatat ctccatcggc agtctgcgcg ggctgcgcac caagtgtca 60

gtgtctaacg acctcacaca gcaggagatc cggaccctag aggcaaagct ggtgaaatac 120

<210> 2

<211> 41

<212> PRT

<213> Homo sapiens

<400> 2

Leu Gln Lys Leu Ile Asp Ile Ser Ile Gly Ser Leu Arg Gly Leu Arg
1 5 10 15

Thr Lys Cys Ser Val Ser Asn Asp Leu Thr Gln Gln Glu Ile Arg Thr
20 25 30

Leu Glu Ala Lys Leu Val Lys Tyr Ile
35 40

<210> 3
<211> 19
<212> DNA
<213> Homo sapiens

<400> 3
ggcagtctgc gcgggctgc 19

<210> 4
<211> 18
<212> DNA
<213> Homo sapiens

<400> 4
tcagtgtcta acgacctc 18

<210> 5
<211> 18
<212> DNA
<213> Homo sapiens

<400> 5
cggaccctag aggcaaag 18

<210> 6
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> antisense oligonucleotide

<400> 6
cagcccgcgc agactgccg 19

<210> 7
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> antisense oligonucleotide

<400> 7
gaggtcgtta gacactga 18

<210> 8
<211> 16
<212> DNA
<213> Artificial Sequence

<220>

<223> antisense oligonucleotide

<400> 8

ctttgcctct agggtc

16

<210> 9

<211> 873

<212> PRT

<213> Mus musculus

<400> 9

Met Asp Arg Ala Ala Leu Arg Ala Ala Ala Met Gly Glu Lys Lys Glu
1 5 10 15

Gly Gly Gly Gly Gly Ala Ala Ala Asp Gly Gly Ala Gly Ala Ala Val
20 25 30

Ser Arg Ala Leu Gln Gln Cys Gly Gln Leu Gln Lys Leu Ile Asp Ile
35 40 45

Ser Ile Gly Ser Leu Arg Gly Leu Arg Thr Lys Cys Ser Val Ser Asn
50 55 60

Asp Leu Thr Gln Gln Glu Ile Arg Thr Leu Glu Ala Lys Leu Val Lys
65 70 75 80

Tyr Ile Cys Lys Gln Gln Gln Ser Lys Leu Ser Val Thr Pro Ser Asp
85 90 95

Arg Thr Ala Glu Leu Asn Ser Tyr Pro Arg Phe Ser Asp Trp Leu Tyr
100 105 110

Ile Phe Asn Val Arg Pro Glu Val Val Gln Glu Ile Pro Gln Glu Leu
115 120 125

Thr Leu Asp Ala Leu Leu Glu Met Asp Glu Ala Lys Ala Lys Glu Met
130 135 140

Leu Arg Arg Trp Gly Ala Ser Thr Glu Glu Cys Ser Arg Leu Gln Gln
145 150 155 160

Ala Leu Thr Cys Leu Arg Lys Val Thr Gly Leu Gly Gly Glu His Lys
165 170 175

Met Asp Ser Gly Trp Ser Ser Thr Asp Ala Arg Asp Ser Ser Leu Gly
180 185 190

Pro Pro Met Asp Met Leu Ser Ser Leu Gly Arg Ala Gly Ala Ser Thr
195 200 205

Gln Gly Pro Arg Ser Ile Ser Val Ser Ala Leu Pro Ala Ser Asp Ser
210 215 220

Pro Val Pro Gly Leu Ser Glu Gly Leu Ser Asp Ser Cys Ile Pro Leu
225 230 235 240

His Thr Ser Gly Arg Leu Thr Pro Arg Ala Leu His Ser Phe Ile Thr
245 250 255

Pro Pro Thr Thr Pro Gln Leu Arg Arg His Ala Lys Leu Lys Pro Pro
260 265 270

Arg Thr Pro Pro Pro Ser Arg Lys Val Phe Gln Leu Leu Pro Ser
275 280 285

Phe Pro Thr Leu Thr Arg Ser Lys Ser His Glu Ser Gln Leu Gly Asn
290 295 300

Arg Ile Asp Asp Val Thr Pro Met Lys Phe Glu Leu Pro His Gly Ser
305 310 315 320

Pro Gln Leu Val Arg Arg Asp Ile Gly Leu Ser Val Thr His Arg Phe
325 330 335

Ser Thr Lys Ser Trp Leu Ser Gln Val Cys Asn Val Cys Gln Lys Ser
340 345 350

Met Ile Phe Gly Val Lys Cys Lys His Cys Arg Leu Lys Cys His Asn
355 360 365

Lys Cys Thr Lys Glu Ala Pro Ala Cys Arg Ile Thr Phe Leu Pro Leu
370 375 380

Ala Arg Leu Arg Arg Thr Glu Ser Val Pro Ser Asp Ile Asn Asn Pro
385 390 395 400

Val Asp Arg Ala Ala Glu Pro His Phe Gly Thr Leu Pro Lys Ala Leu

405	410	415
Thr Lys Lys Glu His Pro Pro Ala Met Asn Leu Asp Ser Ser Ser Asn		
420	425	430
Pro Ser Ser Thr Thr Ser Ser Thr Pro Ser Ser Pro Ala Pro Phe Leu		
435	440	445
Thr Ser Ser Asn Pro Ser Ser Ala Thr Thr Pro Pro Asn Pro Ser Pro		
450	455	460
Gly Gln Arg Asp Ser Arg Phe Ser Phe Pro Asp Ile Ser Ala Cys Ser		
465	470	475
Gln Ala Ala Pro Leu Ser Ser Thr Ala Asp Ser Thr Arg Leu Asp Asp		
485	490	495
Gln Pro Lys Thr Asp Val Leu Gly Val His Glu Ala Glu Ala Glu Glu		
500	505	510
Pro Glu Ala Gly Lys Ser Glu Ala Glu Asp Asp Glu Glu Asp Glu Val		
515	520	525
Asp Asp Leu Pro Ser Ser Arg Arg Pro Trp Arg Gly Pro Ile Ser Arg		
530	535	540
Lys Ala Ser Gln Thr Ser Val Tyr Leu Gln Glu Trp Asp Ile Pro Phe		
545	550	555
Glu Gln Val Glu Leu Gly Glu Pro Ile Gly Gln Gly Arg Trp Gly Arg		
565	570	575
Val His Arg Gly Arg Trp His Gly Glu Val Ala Ile Arg Leu Leu Glu		
580	585	590
Met Asp Gly His Asn Gln Asp His Leu Lys Leu Phe Lys Lys Glu Val		
595	600	605
Met Asn Tyr Arg Gln Thr Arg His Glu Asn Val Val Leu Phe Met Gly		
610	615	620
Ala Cys Met Asn Pro Pro His Leu Ala Ile Ile Thr Ser Phe Cys Lys		
625	630	635
		640

Gly Arg Thr Leu His Ser Phe Val Arg Asp Pro Lys Thr Ser Leu Asp
645 650 655

Ile Asn Lys Thr Arg Gln Ile Ala Gln Glu Ile Ile Lys Gly Met Gly
660 665 670

Tyr Leu His Ala Lys Gly Ile Val His Lys Asp Leu Lys Ser Lys Asn
675 680 685

Val Phe Tyr Asp Asn Gly Lys Val Val Ile Thr Asp Phe Gly Leu Phe
690 695 700

Gly Ile Ser Gly Val Val Arg Glu Glu Arg Arg Glu Asn Gln Leu Lys
705 710 715 720

Leu Ser His Asp Trp Leu Cys Tyr Leu Ala Pro Glu Ile Val Arg Glu
725 730 735

Met Ile Pro Gly Arg Asp Glu Asp Gln Leu Pro Phe Ser Lys Ala Ala
740 745 750

Asp Val Tyr Ala Phe Gly Thr Val Trp Tyr Glu Leu Gln Ala Arg Asp
755 760 765

Trp Pro Phe Lys His Gln Pro Ala Glu Ala Leu Ile Trp Gln Ile Gly
770 775 780

Ser Gly Glu Gly Val Arg Arg Val Leu Ala Ser Val Ser Leu Gly Lys
785 790 795 800

Glu Val Gly Glu Ile Leu Ser Ala Cys Trp Ala Phe Asp Leu Gln Glu
805 810 815

Arg Pro Ser Phe Ser Leu Leu Met Asp Met Leu Glu Arg Leu Pro Lys
820 825 830

Leu Asn Arg Arg Leu Ser His Pro Gly His Phe Trp Lys Ser Ala Asp
835 840 845

Ile Asn Ser Ser Lys Val Met Pro Arg Phe Glu Arg Phe Gly Leu Gly
850 855 860

Thr Leu Glu Ser Gly Asn Pro Lys Met
865 870

<210> 10
<211> 866
<212> PRT
<213> Homo sapiens

<400> 10

Met Gly Glu Lys Glu Gly Gly Gly Gly Gly Asp Ala Ala Ala Ala Glu
1 5 10 15

Gly Gly Ala Gly Ala Ala Ala Ser Arg Ala Leu Gln Gln Cys Gly Gln
20 25 30

Leu Gln Lys Leu Ile Asp Ile Ser Ile Gly Ser Leu Arg Gly Leu Arg
35 40 45

Thr Lys Cys Ala Val Ser Asn Asp Leu Thr Gln Gln Glu Ile Arg Thr
50 55 60

Leu Glu Ala Lys Leu Val Arg Tyr Ile Cys Lys Gln Arg Gln Cys Lys
65 70 75 80

Leu Ser Val Ala Pro Gly Glu Arg Thr Pro Glu Leu Asn Ser Tyr Pro
85 90 95

Arg Phe Ser Asp Trp Leu Tyr Thr Phe Asn Val Arg Pro Glu Val Val
100 105 110

Gln Glu Ile Pro Arg Asp Leu Thr Leu Asp Ala Leu Leu Glu Met Asn
115 120 125

Glu Ala Lys Val Lys Glu Thr Leu Arg Arg Cys Gly Ala Ser Gly Asp
130 135 140

Glu Cys Gly Arg Leu Gln Tyr Ala Leu Thr Cys Leu Arg Lys Val Thr
145 150 155 160

Gly Leu Gly Gly Glu His Lys Glu Asp Ser Ser Trp Ser Ser Leu Asp
165 170 175

Ala Arg Arg Glu Ser Gly Ser Gly Pro Ser Thr Asp Thr Leu Ser Ala

180							185					190				
Ala	Ser	Leu	Pro	Trp	Pro	Pro	Gly	Ser	Ser	Gln	Leu	Gly	Arg	Ala	Gly	
		195					200					205				
Asn	Ser	Ala	Gln	Gly	Pro	Arg	Ser	Ile	Ser	Val	Ser	Ala	Leu	Pro	Ala	
		210					215					220				
Ser	Asp	Ser	Pro	Thr	Pro	Ser	Phe	Ser	Glu	Gly	Leu	Ser	Asp	Thr	Cys	
225					230					235						
Ile	Pro	Leu	His	Ala	Ser	Gly	Arg	Leu	Thr	Pro	Arg	Ala	Leu	His	Ser	
				245					250					255		
Phe	Ile	Thr	Pro	Pro	Thr	Thr	Pro	Gln	Leu	Arg	Arg	His	Thr	Lys	Leu	
				260					265					270		
Lys	Pro	Pro	Arg	Thr	Pro	Pro	Pro	Pro	Ser	Arg	Lys	Val	Phe	Gln	Leu	
				275					280					285		
Leu	Pro	Ser	Phe	Pro	Thr	Leu	Thr	Arg	Arg	Lys	Ser	His	Glu	Ser	Gln	
				290			295					300				
Leu	Gly	Asn	Arg	Ile	Asp	Asp	Val	Ser	Ser	Met	Arg	Phe	Asp	Leu	Ser	
305							310					315			320	
His	Gly	Ser	Pro	Gln	Met	Val	Arg	Arg	Asp	Ile	Gly	Leu	Ser	Val	Thr	
				325							330					
His	Arg	Phe	Ser	Thr	Lys	Ser	Trp	Leu	Ser	Gln	Val	Cys	His	Val	Cys	
				340							345					
Gln	Lys	Ser	Met	Ile	Phe	Gly	Val	Lys	Cys	Lys	His	Cys	Arg	Leu	Lys	
				355									365			
Cys	His	Asn	Lys	Cys	Thr	Lys	Glu	Ala	Pro	Ala	Cys	Arg	Ile	Ser	Phe	
				370											380	
Leu	Pro	Leu	Thr	Arg	Leu	Arg	Arg	Thr	Glu	Ser	Val	Pro	Ser	Asp	Ile	
385							390					395			400	
Asn	Asn	Pro	Val	Asp	Arg	Ala	Ala	Glu	Pro	His	Phe	Gly	Thr	Leu	Pro	
				405											415	

Lys Ala Leu Thr Lys Lys Glu His Pro Pro Ala Met Asn His Leu Asp
420 425 430

Ser Ser Ser Asn Pro Ser Ser Thr Thr Ser Ser Thr Pro Ser Ser Pro
435 440 445

Ala Pro Phe Pro Thr Ser Ser Asn Pro Ser Ser Ala Thr Thr Pro Pro
450 455 460

Asn Pro Ser Pro Gly Gln Arg Asp Ser Arg Phe Asn Phe Pro Ala Ala
465 470 475 480

Tyr Phe Ile His His Arg Gln Gln Phe Ile Phe Pro Asp Ile Ser Ala
485 490 495

Phe Ala His Ala Ala Pro Leu Pro Glu Ala Ala Asp Gly Thr Arg Leu
500 505 510

Asp Asp Gln Pro Lys Ala Asp Val Leu Glu Ala His Glu Ala Glu Ala
515 520 525

Glu Glu Pro Glu Ala Gly Lys Ser Glu Ala Glu Asp Asp Glu Asp Glu
530 535 540

Val Asp Asp Leu Pro Ser Ser Arg Arg Pro Trp Arg Gly Pro Ile Ser
545 550 555 560

Arg Lys Ala Ser Gln Thr Ser Val Tyr Leu Gln Glu Trp Asp Ile Pro
565 570 575

Phe Glu Gln Val Glu Leu Gly Glu Pro Ile Gly Gln Gly Arg Trp Gly
580 585 590

Arg Val His Arg Gly Arg Trp His Gly Glu Val Ala Ile Arg Leu Leu
595 600 605

Glu Met Asp Gly His Asn Gln Asp His Leu Lys Leu Phe Lys Lys Glu
610 615 620

Val Met Asn Tyr Arg Gln Thr Arg His Glu Asn Val Val Leu Phe Met
625 630 635 640

Gly Ala Cys Met Asn Pro Pro His Leu Ala Ile Ile Thr Ser Phe Cys
645 650 655

Lys Gly Arg Thr Leu His Ser Phe Val Arg Asp Pro Lys Thr Ser Leu
660 665 670

Asp Ile Asn Lys Thr Arg Gln Ile Ala Gln Glu Ile Ile Lys Gly Met
675 680 685

Gly Tyr Leu His Ala Lys Gly Ile Val His Lys Asp Leu Lys Ser Lys
690 695 700

Asn Val Phe Tyr Asp Asn Gly Lys Val Val Ile Thr Asp Phe Gly Leu
705 710 715 720

Phe Gly Ile Ser Gly Val Val Arg Glu Gly Arg Arg Glu Asn Gln Leu
725 730 735

Lys Leu Ser His Asp Trp Leu Cys Tyr Leu Ala Pro Glu Ile Val Arg
740 745 750

Glu Met Thr Pro Gly Lys Asp Glu Asp Gln Leu Pro Phe Ser Lys Ala
755 760 765

Ala Asp Val Tyr Ala Phe Gly Thr Val Trp Tyr Glu Leu Gln Ala Arg
770 775 780

Asp Trp Pro Leu Lys Asn Gln Ala Ala Glu Ala Ser Ile Trp Gln Ile
785 790 795 800

Gly Ser Gly Glu Gly Met Lys Arg Val Leu Thr Ser Val Ser Leu Gly
805 810 815

Lys Glu Val Ser Glu Ile Leu Ser Ala Cys Trp Ala Phe Asp Leu Gln
820 825 830

Glu Arg Pro Ser Phe Ser Leu Leu Met Asp Met Leu Glu Lys Leu Pro
835 840 845

Lys Leu Asn Arg Arg Leu Ser His Pro Gly His Phe Trp Lys Ser Ala
850 855 860

Glu Leu
865

<210> 11
<211> 4094
<212> DNA
<213> Mus musculus

<400> 11
gaattccctc ggggctttcc tgccgaggcg cccgtgtccc cgggctcctc gcctcggccc 60
ccagcggccc cgatgccgag gcatggatag agcggcggtg cgcgcggcag cgatgggcga 120
gaaaaaggag ggcggcggcg ggggcgccgc ggcggacggg ggcgcagggg ccgccgtcag 180
ccgggcgctg cagcagtgcg gccagctgca gaagctcatc gatatctcca tcggcagtct 240
gcgcgggctg cgcaccaagt gctcagtgtc taacgacctc acacagcagg agatccggac 300
cctagaggca aagctggtga aatacatttg caagcagcag cagagcaagc ttagtgtgac 360
cccaagcgac aggaccgccg agctcaacag ctaccacgc ttcagtgact ggctgtacat 420
cttcaacgtg aggcctgagg tgggtgcagga gatcccccaa gagctcacac tggatgctct 480
gctggagatg gacgaggcca aagccaagga gatgctgcgg cgctgggggg ccagcacgga 540
ggagtgcagc cgcctacagc aagcccttac ctgccttcgg aaggtgactg gcctgggagg 600
ggagcacaaa atggactcag gttggagttc aacagatgct cgagacagta gcttggggcc 660
tcccatggac atgctttcct cgctgggcag agcgggtgcc agcactcagg gaccccgttc 720
catctccgtg tccgccctgc ctgcctcaga ctctccggtc cccggcctca gtgagggcct 780
ctcggactcc tgtatcccct tgcacaccag cggccggctg accccccggg ccctgcacag 840
cttcatcacg cccctacca caccacagct acgacggcac gccaaagctga agccaccaag 900
gacaccccca ccgccaagcc gcaaggtctt ccagctgctc ccagcttcc ccacactcac 960
acggagcaag tcccacgagt ccagctggg aaaccgaatc gacgacgtca ccccgatgaa 1020
gtttgaactc cctcatggat cccacagct ggtacgaagg gatatcgggc tctcggtgac 1080
gcacaggttc tccacaaagt catggttgtc acaggtgtgc aacgtgtgcc agaagagcat 1140
gatttttggc gtgaagtgca aacactgcag gttaaaatgc cataacaagt gcacaaagga 1200
agctcccgcc tgcaggatca ccttcctccc actggccagg cttcggagga cagagtctgt 1260
cccgtcagat atcaacaacc cagtggacag agcagcagag ccc'cattttg gaacccttcc 1320
caaggccctg acaaagaagg agcacctcc agccatgaac ctggactcca gcagcaaccc 1380
atcctccacc acgtcctcca caccctcatc gccggcacct ttcctgacct catctaattcc 1440

ctccagtgcc accacgcctc ccaacccgtc acctggccag cgggacagca ggttcagctt	1500
cccagacatt tcagcctgtt ctcaggcagc cccgctgtcc agcacagccg acagtacacg	1560
gctcgacgac cagcccaaaa cagatgtgct aggtgttcac gaagcagagg ctgaggagcc	1620
tgaggctggc aagtcagagg cagaggatga cgaggaggat gaggtggacg acctccccag	1680
ctcccgccgg ccctggaggg gccccatctc tcgaaaggcc agccagacca gcgtttacct	1740
gcaagagtgg gacatcccct ttgaacaggt ggaactgggc gagcccattg gacagggtcg	1800
ctggggccgg gtgcaccgag gccgttggca tggcgagggtg gccattcggc tgctggagat	1860
ggacggccac aatcaggacc acctgaagct gttcaagaaa gaggtgatga actaccggca	1920
gacgcggcat gagaacgtgg tgctcttcat gggggcctgc atgaaccac ctcacctggc	1980
cattatcacc agcttctgca aggggcggac attgcattca ttcgtgaggg accccaagac	2040
gtctctggac atcaataaga ctaggcagat cggccaggag atcatcaagg gcatgggtta	2100
tcttcatgca aaaggcatcg tgcacaagga cctcaagtcc aagaatgtct tctatgacaa	2160
cggcaaagtg gtcatcacag acttcgggct gtttgggatc tcgggtgtgg tccgagagga	2220
acggcgcgag aaccaactga aactgtcaca tgactggctg tgctacctgg cccccgagat	2280
cgtacgagaa atgatcccgg ggcgggacga ggaccagctg cccttctcca aagcagccga	2340
tgtctatgca ttcgggactg tgtggtatga actacaggca agagactggc cctttaagca	2400
ccagcctgct gaggccttga tctggcagat tggaagtggg gaaggagtac ggcgcgtcct	2460
ggcatccgtc agcctgggga aggaagtcgg cgagatcctg tctgcctgct gggctttcga	2520
tctgcaggag agaccagct tcagcctgct gatggacatg ctggagaggc tgcccaagct	2580
gaaccggcgg ctctcccacc ctgggcactt ttggaagtcg gctgacatta acagcagcaa	2640
agtcatgccc cgctttgaaa ggtttggcct ggggaccctg gagtccggta atccaaagat	2700
gtagccagcc ctgcacgttc atgcagagag tgtcttcctt tcgaaaacat gatcacgaaa	2760
catgcagacc accacctcaa ggaatcagaa gcattgcac ccaagctgcg gactgggagc	2820
gtgtctcctc cctaaaggac gtgcgtgcgt gcgtgcgtgc gtgcgtgcgt gcgtgcgtca	2880
ccaaggtgtg tggagctcag gatcgcagcc atacacgcaa ctccagatga taccactacc	2940
gccagtgttt acacagaggt ttctgcctgg caagcttggg attttacagt aggtgaagat	3000
cattctgcag aaggggtgctg gcacagtgga gcagcacgga tgtccccagc ccccgttctg	3060
gaagacccta cagctgtgag agggccaggg ttgagccaga tgaaagaaaa gctgcgtggg	3120

tgtgggctgt	acccgga	aaa	gggcaggtgg	caggaggttt	gccttggcct	gtgcttgggc	3180
cgagaaccac	actaaggagc	agcagcctga	gtaggaatc	tatctggatt	acggggatca		3240
gagttcctgg	agagtggact	cagtttctgc	tctgatccag	gcctgttggtg	cttttttttt		3300
ttccccctta	aaaaaaaaa	agtacagaca	gaatctcagc	ggcttctaga	ctgatctgat		3360
ggatcttagc	ccggcttcta	ctgcgggggg	gaggggggga	gggatagcca	catatctgtg		3420
gagacacca	cttctttatc	tgaggcctcc	aggtaggcac	aaaggctgtg	gaactcagcc		3480
tctatcatca	gacaccccc	ccaatgcct	cattgacccc	cttccccccag	agccaagggc		3540
tagcccatcg	ggtgtgtgta	cagtaagttc	ttggtgaagg	agaacaggga	cgttggcaga		3600
agcagtttgc	agtggcccta	gcattcttaa	acccattgtc	tgtcacacca	gaaggttcta		3660
gacctaccac	cacttccctt	ccccatctca	tggaaacctt	ttagccatt	ctgaccctg		3720
tgtgtgctct	gagctcagat	cgggttatga	gaccgcccag	gcacatcagt	cagggaggct		3780
ctgatgtgag	ccgcagacct	ctgtgttcat	tcctatgagc	tggaggggct	ggactgggtg		3840
gggtcagatg	tgcttggcag	gaactgtcag	ctgctgagca	gggtgggtccc	tgagcggagg		3900
ataagcagca	tcagactcca	caaccagagg	aagaaagaaa	tggggatgga	gcggagaccc		3960
acgggctgag	tcccgtgtg	gagtggcctt	gcagctccct	ctcagttaaa	actcccagta		4020
aagccacagt	tctccgagca	ccaagtctg	ctccagccgt	ctcttaaaac	aggccactct		4080
ctgagaagga	attc						4094

<210> 12
 <211> 3772
 <212> DNA
 <213> Homo sapiens

<400> 12	
gcgaagctgg	tccgttacat
ttgtaagcag	aggcagtgca
agctgagcgt	ggctccccgt
	60
gagaggaccc	cagagctcaa
cagctacccc	cgcttcagcg
actggctgta	cactttcaac
	120
gtgaggccgg	aggtgggtgca
ggagatcccc	cgagacctca
cgctggatgc	cctgctggag
	180
atgaatgagg	ccaaggtgaa
ggagacgctg	cggcgctgtg
gggccagcgg	ggatgagtgt
	240
ggccgtctgc	agtatgccct
cacctgcctg	cggaaggtga
caggcctggc	ttcatcacc
	300
cgcccaccac	acccagctg
cgacggcaca	ccaagctgaa
gccaccacgg	acgccccccc
	360
caccagccg	caaggtcttc
cagctgctgc	ccagcttccc
cacactcacc	cggagcaagt
	420
cccatgagtc	tcagctgggg
aaccgcattg	atgacgtctc
ctcgatgagg	tgagttggga
	480

gcacgttcct gcacgtggct atgctgtggg gcctctctca tgagtcagag cggagggaga	540
cagctgtgcc tctggagtct gcttttaatt gtctggaaat gcagagatgt ctggtttttg	600
cctgagcaaa ataggagttt atttttgtac tatccccgagc tggctaagga gagtcacgta	660
gctgtgggcg gggctcttggg gatgaggagg ggtacagcag gcagggacta tgctgaagtg	720
gagctggctg taggaacccc agggaggcac agggggagca tgaagaggag ctacacttcc	780
ctcccttagt gcccgggcag aaactcccag ggcccttcac agaaccttgg aggaacattc	840
aacaccccca tctctaggac agccccagcc ttgtcatcct ccaattgctg tggtaacacg	900
gggactggag cagtgagatt attaggcctt cagggccagt gtctccatgc agatcagatg	960
gaggcgggtg ttggcacata caccacctca ctgcccacgc cccagaagt tggcgcagat	1020
cataaggtgg cttttggggc taattgattg aagttccaac atagtctgtt tctcctaggc	1080
tggtagctgg cacctttggc cccatgtgtt ttttaattat tttttctttt gagacgaaat	1140
ctcgctctat cccccaggct gaagtgcagt agtgcaatct cagctcactg cagcctctgc	1200
ctccccgggt caagcaattc tcctgcctca gcctcccag tagccaggat taaaggtgcc	1260
tgccaccaca catggctaata ttttgtattt ttaatagaga cgggggtttca ccatgttagc	1320
caggctggtc tcaaactcct gacctcaggt gatcttcctg cctcagcctc ccaaagtgtc	1380
gggattacag gtgtgagcca ctgcgcccag tcatgcccac gtgttttggt ggtcttggct	1440
gctgatgggt ggggtgagcc ccaggaggaa gttgggacaa gtcaacctca tggcagatgt	1500
gccagggaga gctgcgggtg agatagattg ttcctatccc cctctccttg atgtgggagg	1560
actcagtacc tccagcacac ctttctcatg gaggttggtt atgtggtact tggcctcaag	1620
tgaaccagca cttcatgagt ccagctttgt gctagaccag cacttgggat tgaggggggc	1680
agtggccacc ctcgggggac cttctgactc agaggacatg agatggccac actcgagcac	1740
tgtgttcctg acctttctgg gtcacaggtc accttgatga ttggatgaaa gtcttagatc	1800
ttctttccag agaaaagtct acaacattct actgaaccag tccagagggg tcccggaccc	1860
ccgaagccca cccatgggct ggctctggga ggcaatggcg ctgagtatgg gggcatctct	1920
cgcattggatc cccacagatg gtacggaggg atatcgggct gtcggtgacg cacaggttct	1980
ccaccaagtc ctggctgtcg caggtctgcc acgtgtgcca gaagagcatg atatttggag	2040
tgaagtgcaa gcattgcagg ttgaagtgtc acaacaaatg taccaaagaa gcccctgcct	2100
gtagaatatc cttcctgcca ctaactcggc ttcggaggac agaactctgtc ccctcggaca	2160
tcaacaaccc ggtggacaga gcagccgaac cccatttttg aaccctcccc aaagcactga	2220

caaagaagga gcaccctccg gccatgaatc acctggactc cagcagcaac ccttcctcca	2280
ccacctcctc cacaccctcc tcaccggcgc ccttcccgac atcatccaac ccatccagcg	2340
ccaccacgcc ccccaacccc tcacctggcc agcgggacag caggttcaac ttcccagctg	2400
cctacttcat tcatcataga cagcagttta tctttccaga catttcagcc tttgcacacg	2460
cagccccgct ccctgaagct gccgacggta cccggctcga tgaccagccg aaagcagatg	2520
tgttggaagc tcacgaagcg gaggctgagg agccagaggc tggcaagtca gaggcagaag	2580
acgatgagga cgaggctggac gacttgccga gctctcgccg gccctggcgg ggccccatct	2640
ctcgcaaggc cagccagacc agcgtgtacc tgcaggagtg ggacatcccc ttcgagcagg	2700
tagagctggg cgagcccatc gggcagggcc gctggggccg ggtgcaccgc ggccgctggc	2760
atggcgaggt ggccattcgc ctgctggaga tggacggcca caaccaggac cacctgaagc	2820
tcttcaagaa agaggctgatg aactaccggc agacgcggca tgagaacgtg gtgctcttca	2880
tgggggcctg catgaacccg ccccacctgg ccattatcac cagcttctgc aaggggcgga	2940
cgttgcactc gtttgtgagg gacccaaga cgtctctgga catcaacaag acgaggcaaa	3000
tcgctcagga gatcatcaag ggcattggat atcttcatgc caagggcatc gtacacaaa	3060
atctcaaadc taagaacgtc ttctatgaca acggcaaggt ggtcatcaca gacttcgggc	3120
tgtttgggat ctcaggcgtg gtccgagagg gacggcgtga gaaccagcta aagctgtccc	3180
acgactggct gtgctatctg gccctgaga ttgtacgcga gatgaccccc gggaaggacg	3240
aggatcagct gccattctcc aaagctgctg atgtctatgc atttgggact gtttggtatg	3300
agctgcaagc aagagactgg cccttgaaga accaggctgc agaggcatcc atctggcaga	3360
ttggaagcgg ggaaggaatg aagcgtgtcc tgacttctgt cagcttgggg aaggaagtca	3420
gtgagatcct gtcggcctgc tgggctttcg acctgcagga gagaccacgc ttcagcctgc	3480
tgatggacat gctggagaaa cttcccaagc tgaaccggcg gctctccac cctggacact	3540
tctggaagtc agctgagttg taggcctggc tgccttgcac gcaccagggg ctttcttct	3600
cctaataaac aactcagcac cgtgacttct gctaaaatgc aaaatgagat gcgggcacta	3660
accagggga tgccacctct gctgctccag tcgtctctct cgaggctact tcttttgctt	3720
tgttttaaaa actggccctc tgccctctcc acgtggcctg catatgccca ag	3772

<210> 13
 <211> 24
 <212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 13

ggaaccttac ttctgtggtg tgac

24

<210> 14

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 14

tagcagacac tctatgcctg tgtg

24

<210> 15

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> sense oligonucleotide

<400> 15

cggaccctag aggcaaag

18

<210> 16

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> control oligonucleotide

<400> 16

cacgtcacgc gcgcactatt

20

<210> 17

<211> 6

<212> PRT

<213> Homo sapiens

<400> 17

Gly Ser Leu Arg Gly Ile

1

5

<210> 18

<211> 6
<212> PRT
<213> Homo sapiens

<400> 18

Ala Val Ser Asn Asp Leu
1 5

<210> 19
<211> 6
<212> PRT
<213> Homo sapiens

<400> 19

Arg Thr Leu Glu Ala Lys
1 5

<210> 20
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 20
tatctccatc ggcagtct

18

<210> 21
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 21
tcgacgctca cacttcaa

18

<210> 22
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 22
ctgaccgctt cctcgtg

17

<210> 23
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 23
atagagccca ccgcatcc